RELATION OF NON-ALCOHOLIC FATTY LIVER DISEASE TO THE METABOLIC SYNDROME: THE MULTI-ETHNIC STUDY OF Atherosclerosis

Poster Contributions
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Background: There is overlap between risk factors for non-alcoholic fatty liver disease (NAFLD) and metabolic syndrome (MetS) and prevalence of both conditions vary by age, gender and race. In this study, we assessed association of MetS and its components with NAFLD in a multi-ethnic population.

Methods: The Multi-Ethnic Study of Atherosclerosis is a longitudinal, population based study of 6,814 participants free of CVD at baseline. Liver fat content was measured from cardiac CT scans using liver-to-spleen ratio of <1.0 and liver Hounsfield attenuation <40. Participants with heavy alcohol intake (>14 drinks/week for men & >7 for women), self reported cirrhosis and missing information were excluded. The prevalence of NAFLD was compared in 4,140 participants with MetS (n=1,154, ATP III criteria), diabetes (n=554), or neither condition (n=2,432).

Results: The prevalence of NAFLD for those with neither conditions, MetS, or diabetes was, respectively, 9%, 28%, and 29% (p<0.001). Odds ratio (OR) for presence of NAFLD were highest for diabetics [OR 4.16 (95% CI 3.24, 5.33)], followed by the presence of MetS [OR 3.97 (95% CI 3.26, 4.83)]. Among components of MetS, central obesity [OR 3.41 (95% CI 2.77, 4.20)], impaired fasting glucose/DM [OR 2.99 (95% CI 2.49, 3.59)], high triglycerides [OR 2.70 (95% CI 2.27,3.23)], low HDL [OR 2.36 (95% CI 1.99, 2.80)] and elevated blood pressure [OR 1.97 (95% CI 1.62, 2.39)] were strong predictors of NAFLD. Odds ratio for presence of moderate to severe NAFLD were higher for presence of MetS [OR 5.92 (95% CI 4.29, 8.19)] compared with diabetes [OR 5.35 (95% CI 3.57,8.01)] using <40 HU cutoff. Central obesity was still the strongest predictor for presence of moderate to severe NAFLD [OR 5.58 (95% CI 3.86, 8.06)]. Odds of NAFLD increased significantly for combination of MetS components: 9.49 (95% CI 5.67, 15.90) and 24.05 (95% CI 12.73,45.45) for presence of 3 and 5 MetS components, respectively.The results were adjusted for age, gender, ethnicity, LDL, smoking and lipid lowering medications.

Conclusion: Current study shows that components of MetS are strong predictors of fatty liver and increased risk with increasing number of MetS components in a multi-ethnic population.